REMARKS/ARGUMENTS

Claims 1-19 are pending in the application. Claims 1-19 stand rejected.

The Amendment
In the Claims

Claim 1 has been amended to recite that the *Parthenium* species lignocellulosic plant material in Applicants' composite has naturally occurring resin. That is, the resin which naturally occurs in the *Parthenium* species plant material has not been removed from the plant material. This amendment is fully supported by applicants' specification. See, in particular, paragraphs [0005], [0012], [0038], and Table 1, second footnote. The bagasse extraction procedure to extract rubber but not the resin is water-based (see paragraphs [0038], and [0078]. See also, Nakayama et al., 1996 cited in paragraph [0005] (copy enclosed)). As noted in paragraph [0012], applicants "obtained composites having excellent termite resistance and decay resistance by direct use of *Parthenium* spp. whole plant, plant parts or bagasse material to make the *Parthenium* spp.-plastic composites of the invention. That is, termite and fungus-resistant products were obtained while avoiding the need to extract the natural resin from *Parthenium* spp" (emphasis added). Further, as noted in paragraph [0038], because "latex extraction is done by a water-based process, little of the plant resin is removed."

Claim 1 has also been amended to recite that the plastic in the composite is a synthetic organic polymer plastic. This amendment is fully supported by applicants' specification. See, in particular, paragraphs [0042], [0095], [0099], Tables1-2, paragraph [0102], and Table 3.

Claim 1 has also been amended to recite that the ratio of plastic to plant material ranges by weight from 80% plastic:20% plant material to 20% plastic:80% plant material. This amendment is fully supported by applicants' specification. See, in particular, paragraph [0056].

Claims 8 and 11 have been amended to recite that the acetal, vinyl, allylic, and amino terms refer to synthetic organic polymers which contain these groups. Support therefor is in applicants' specification. See, in particular, paragraphs [0042] and [0059]. This is discussed in detail below in applicant's response under 35 U.S.C. 112, second paragraph.

Claims 9 and 12 have been amended to recite that the ratio of plastic to plant material ranges by weight from 80% plastic to 20% plant material to 30% plastic to 70% plant material. This amendment is fully supported by applicants' specification. See, in particular, paragraphs [0056], [0095], [0099], Tables1-2, paragraph [0102], and Table 3.

Claim 17 has been amended to be independent. Claim 17 has also been amended to recite that the *Parthenium* species lignocellulosic plant material has naturally occurring resin and that the plastic is synthetic organic polymer plastic. Support for these amendments is as discussed above for claim 1. Claim 17 has also been amended to recite that the decrease in termite infestation is as determined by ASTM standard test D-3345. Support for this amendment is in the specification, paragraphs [0057], [0097], [0099], and Tables 1-2.

Claim 18 has been amended to be independent. Claim 18 has also been amended to recite that the *Parthenium* species lignocellulosic plant material has naturally occurring resin and that the plastic is synthetic organic polymer plastic. Support for these amendments is as discussed above for claim 1.

Claim 19 has been amended to depend on claim 17. Support therefor is in the specification, paragraphs [0057], [0097], [0099], and Tables 1-2.

Fees

It is believed that no additional fees are owed due to this amendment, however if it is determined that fees are due, the Commissioner is authorized to charge these fees to Deposit Account No. 50-2135. The Commissioner is also authorized to charge any other fees required due the attached amendment or any other action during the pendency of this application, or credit any overpayment, to Account No. 50-2135.

Rejection Under 35 U.S.C. 112, Second Paragraph

Claims 8, 11 and 17-19 stand rejected under 35 U.S.C.112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In particular, the Examiner has stated that the recitations in claim 8 of the terms "acetal" and "vinyl" and in claim 11 of "allylic" and amino" render those claims as vague and confusing.

Applicants respectfully submit that claims 8 and 11, as amended, fully meet the requirements of 35 U.S.C.112, second paragraph. Claim 8 has been amended to point out that the thermoplastic is a synthetic organic polymer which contains acetal groups or vinyl groups. Claim 11 has been amended to point out that the thermoset is a synthetic organic polymer which contains allylic groups or amino groups such as melamine and urea organic polymers. Support for these amendments is in applicants' specification at [0042] and [0059].

Applicants respectfully submit that these terms are well known in the art, that synthetic organic polymers having these groups are well known, and that the recitation of

these terms does not render the claims indefinite. These terms are found in reference books describing synthetic polymers.

Applicants present the following information to further support applicants' position. U.S. Patent No. 5,656,207 states that "Examples of thermosetting plastic matrix polymers include alkyds, aminos (melamines and ureas), allylics such as diallyl phthalate and diallyl isophthalate...." and "Examples of suitable thermoplastic matric polymers include ABS plastics (acrylonitrile-butadiene-styrene); acetals...."

U.S. Patent Nos. 6,478,863; 6,432,194; and 6,336,965 state that "Typical kinds of thermoplastic resins include: (1) acrylonitrile-butadiene-styrene (ABS) resins; (2) acetals; (3) acrylics; (4) cellulosics; (5) chlorinated polyethers; (6) fluorocarbons, such as polytetrafluoroethylene (TFE), polychlorotrifluoroethylene (CTFE), and fluorinated ethylene propylene (FEP); (7) nylons (polyamides); (8) polycarbonates; (9) polyethylenes (including copolymers); (10) polypropylenes (including copolymers); (11) polystyrenes; (12) vinyls (polyvinyl chloride); (13) thermoplastic polyesters, such as polyethylene terephthalate or polybutylene terephthalate; (14) polyphenylene ether alloys; and blends and alloys of the above with rubber modifiers. Typical thermosetting resins include: (1) alkyd; (2) allylics; (3) the aminos (melamine and urea); (4) epoxies; (5) phenolics; (6) polyesters; (7) silicones; and (8) urethanes." Other references to vinyl polymers, acetal polymers, and amino polymers occur throughout these patents.

U.S. Patent No. 4,284,729 states that "Examples of such [thermosetting] resins include alkyds, allylics, the aminos, e.g., melamine and urea, epoxies, phenolics, polyesters, silicones and urethanes."

In view of the foregoing, it is submitted that claims 8 and 11, as amended, meet the requirements of 35 U.S.C. 112, second paragraph. If the Examiner is not in agreement, applicants' attorney, the undersigned, earnestly requests a phone interview to discuss this.

Claims 17-19 stand rejected under 35 U.S.C. 112, second paragraph, because it is alleged that the composite of claims 17-19 is defined by its properties and not by its composition or other factors determinative thereof. It is further alleged that the proper metes and bounds of the claims cannot be clearly ascertained, and the claims are, thus, vague.

Applicants respectfully submit that claims 17-19, as amended, fully meet the requirements of 35 U.S.C.112, second paragraph. The composition of claims 17-19 is defined by its composition, namely, a "composite comprising *Parthenium* species lignocellulosic plant material having naturally occurring resin and synthetic organic polymer plastic." It is submitted that the additional properties of the composition, namely, that the

composition exhibits "at least 30% decrease in termite infestation relative to a composition not containing [*Parthenium*] plant material ... as determined by ASTM standard test D-3345" (claim 17); exhibits "a rating of resistant or highly resistant to *Gleophyllum trabeum* or *Poria placenta* decay fungi as determined by ASTM standard test D-2017" (claim 18); or exhibits "a termite resistance rating of high or heavy termite mortality as determined by ASTM standard test D-3345 (claim 19) do not render the claims vague for the following reasons.

Claims 17-19 refer to distinctive characteristics which can be determined with precision and definiteness which are the requirements of 35 U.S.C. 112, second paragraph. The composite characteristics recited in claims 17-19 refer to specific ASTM standard tests. As noted in applicants' specification at [0050] "ASTM (American Standards for Testing Materials) standards establish in great detail how a particular test is to be conducted. ASTM standards are set to insure that test results are comparable from one test location to another test location" (emphasis added).

A review of the U.S. patents issued since 1976 indicates that over 3500 patents have been issued which recite ASTM standards in the claims.

It is submitted that Patent case law also supports the proposition that claims 17-19 meet the requirements of 35 U.S.C. 112, second paragraph. The Court has held that if the scope of subject matter embraced by a claim is clear and if the applicant has not otherwise indicated that he intends the claim to be of a different scope, then the claim particularly points out and distinctly claims the subject matter which the applicant regards as his invention (*In re Borkowski et al.* (CCPA 1970) 422 F2d 904, 164 USPQ 642; *In re Robins* (CCPA 1970) 429 F2d 452, 166 USPQ 552). In the instant case, applicants' claims 17-19 are defined clearly by the composition components and by properties that can be determined with certainty. There is no intent that claims 17-19 be of a different scope.

The Court has held that a claim containing terms which are seemingly vague is not indefinite if it is precise when read in the context of the specification (*Charvat v. Comr. Pats.* (CADC 1974) 503 F2d 138, 182 USPQ 577; *In re Mattison et al.* (CCPA 1975) 509 F2d 563, 184 USPQ 484). In the instant case, applicants' claims 17-19 make reference to standard tests which are precise. This is described in the specification.

The holdings of the Court in *Oakley Inc. v. Sunglass Hut International* (CAFC 2003) 65 USPQ2d 1321and *In re Marosi, Stabenow, and Schwarzmann* (CAFC 1983) 218 USPQ 289 also support the proposition that claims 17-19 meet the requirements of 35 U.S.C. 112, second paragraph.

In sum, applicants' composition of claims 17-19 are defined by its compositional make up and by properties that can be determined with certainty using standard test procedures that insure that test results are comparable from one test location to another. Additionally, applicants have provided examples of composites of claims 17-19.

In view of the foregoing, it is submitted that claims 17-19 fully meet the requirements of 35 U.S.C. 112, second paragraph. If the Examiner is not in agreement, applicants' attorney, the undersigned, earnestly requests a phone interview to discuss this.

Rejection Under 35 U.S.C. 102

Claims 1-9, 13, 14, and 16 stand rejected under 35 U.S.C. 102(b) as being anticipated by Schloman, Jr. (U.S. Patent No. 4,988,388), newly cited. In particular, the Examiner alleges that the Schloman patent teaches the production of composites that may comprise particulate bagasse material from the guayule plant in admixture with guayule resin, which the Examiner interprets broadly to mean "a vinyl-type resin" allegedly as recited in claims 1-3, 7, 8, and 13. The Examiner cites Schloman against claims 4-5, citing col. 1, lines 18-45. The Examiner cites Schloman against claim 6, citing the paragraph bridging col. 5 to col .6, and col. 4, line 37 to col. 5, line 29. The Examiner further alleges that the proportions of constituents as recited in claim 9 are shown in Schloman at col. 8, lines 7-11. The Examiner cites col. 7, lines 45-61 against claim 14 and col. 6, lines 48-61 against claim 16. The Examiner notes Examples 1-4 in col. 8 of Schloman.

Applicants respectfully submit that the claims 1-9, 13, 14, and 16, as amended, are not anticipated by the Schloman patent for the following reasons.

Applicants claims 1-9, 13, 14, and 16, as amended, are drawn to composites comprising *Parthenium* species lignocellulosic plant material having naturally occurring resin and synthetic organic polymer plastic, wherein the ratio of plastic to plant material ranges by weight from 80% plastic:20% plant material to 20% plastic:80% plant material. As discussed in detail below: (1) the plant material of applicants' claimed invention and the bagasse of Schloman are chemically distinct; (2) the synthetic organic polymer plastic of applicants' claimed invention and the extracted guayule resin of Schloman are chemically distinct, and (3) the properties of applicants' claimed composites are distinct from the free-flowing particulate composition of the Schloman patent. Thus, the composites of applicants' claimed invention are not anticipated by the Schloman patent.

The Schloman patent describes a free-flowing particulate composition, useful as a soil amendment, which is prepared from guayule processing by-products, namely, bagasse and guayule resin extract, obtained when guayule is processed for the recovery of rubber (col. 3, lines 13-14). The extraction procedures used are solvent extraction (col. 1, lines 48–64; col.

4, lines 36-47; col. 5, lines 50-end) to remove the rubber and resin from guayule bagasse. The resultant bagasse is resin-free and rubber-free. This is further described by Schloman et al., in *Bioresource Technology* 35: 191-196 (1991) (copy enclosed). The bagasse extraction process is based on a mixture of organic solvents (azeotropic mixture of acetone and pentane) that will simultaneously remove the rubber and resin from the plant material (see page 192 of Schloman et al. reference).

In contrast to Schloman, the *Parthenium* species plant material of applicants' claimed invention has naturally occurring (unextracted) resin. The bagasse used in applicants' claimed invention is that obtained by an extraction process wherein rubber (latex) is extracted from the bagasse without the extraction of the natural resin. (See applicants' specification, paragraphs [0005], [0012], [0017] [0033], [0037].) Thus, the bagasse contains the natural resin, e.g., 10 to 15%. (See applicants' specification, paragraphs [0005], [0038], and Table 1, second footnote.) The bagasse extraction procedure to extract rubber but not the resin is water-based (see paragraphs [0038], and [0078]. See also, Nakayama et al., 1996 cited in paragraph [0005] (copy enclosed)).

The resin used in the Schloman composition is extracted resin which is obtained by solvent extraction of guayule. Guayule resin is a natural resin, and is typically an oil or gum and is not a substance capable of being molded into solid form of plastic. To make the free-flowing particulate composition of Schloman, (a) the guayule resin is dissolved in a solvent or dispersant, (b) combined with the resin-free and rubber-free bagasse particles to form a mixture, and (c) the solvent or dispersant is removed from the mixture, for example, by evaporation, to recover a resin-bagasse particulate composition as a residue (col. 3, line 66 to col. 4, line 3).

In contrast to the extracted guayule resin of Schloman (which the Examiner characterizes as "a vinyl-type resin"), the plastic of applicants' claimed composites is synthetic organic polymer plastic. This is described in applicants' specification, paragraphs [0042], [0095], [0099], Tables1-2, paragraph [0102], and Table 3. Such synthetic organic polymer resins are chemically distinct from the extracted natural resin of Schloman.

The product of the Schloman patent is a free-flowing particulate composition useful as fuel or soil amendments. In contrast to Schloman, applicants' composites have structural stability and can be used to make numerous items, particularly those used for construction such as lumber, plywood, particleboard, fiberboard, poles, railroad crossties as described in paragraph [0014] of the specification. In addition, applicants' composites provide termite and fungal resistance and are useful for making insect- and fungal-resistant wood products (see paragraph [0013] and Tables 1-3 of the specification). Applicants have shown that impregnating wood (Southern pine wood) with 10% resin does not provide termite resistance

(see in Table 1 of the specification). This could be likened to impregnating a resin-free wood with resin as described by Schloman. Applicants submit that this example further supports that the claimed invention is not anticipated by the Schloman patent.

In view of foregoing, it is submitted that claims 1-9, 13, 14, and 16, as amended, are not anticipated by Schloman.

Rejection Under 35 U.S.C. 103

Claims 1-16 stand rejected under 35 U.S.C. 103(a) allegedly as being unpatentable over Schloman, Jr. as applied to claims 1-9, 13, 14 and 16, above, and further in view of Chow (U.S. Patent No. 3,927,235), newly cited.

Applicants respectfully submit that claims 1-16, as amended, define an invention which, taken as a whole, is unobvious over the cited art, taken alone or in combination for the following reasons.

Applicants' claims 1-16, as amended, are drawn to composites comprising *Parthenium* species lignocellulosic plant material having naturally occurring resin and synthetic organic polymer plastic, wherein the ratio of plastic to plant material ranges by weight from 80% plastic:20% plant material to 20% plastic:80% plant material. As discussed above, the plant material of applicants' claimed invention and the bagasse of Schloman are chemically distinct; the synthetic organic polymer plastic of applicants' invention and the extracted guayule resin of Schloman are chemically distinct; the products of the invention and Schloman are different and the properties of applicants' composites are not taught or suggested by the Schloman patent.

It is submitted that the secondary reference does not cure the deficiencies of the primary reference for the following reasons. As discussed in detail below: (1) the plant material of applicants' invention is different from the plant material of Chow; (2) the amount of synthetic organic polymer plastic of applicants' claimed invention of claims 1-16, as amended, is distinct from and not suggested by Chow, and (3) the composites and the composite properties of applicants' claimed invention are distinct and unobvious over Chow, alone or in combination with Schloman.

The Chow patent describes particleboard products from fibers other than softwood fibers. Chow describes a sandwich type of particle board using long-fiber plant residues or s-plant-fibers (cornstalk, bagasse, hemp stalk, cotton stalk, and kenaf stalk) or wood veneers as face and back layers and using the short-fiber plant fiber residues or exo-s-plant fibers (tree bark, needles and leaves, seed shells, hulls husks, pits, corn cobs coffee grounds) as the core layer, and resulted in the bending strength of the reconstituted board approaching to a board

made from the homogenous kind of construction using 100% s-plant fibers or wood veneers. In Column 2, line 18-21, Chow describes that it is a novel technique to use the "one-step pressing operation" in a sandwich board construction. First you press and make the finished particle board core, then second you overlay the veneer sheets on the consolidated board face and back in order to make a sandwich board panel.

Chow does not teach or suggest that *Parthenium* species lignocellulosic plant material having naturally occurring resin (which is a critical component of applicants' invention) could be used to make the sandwich particle board panels of the Chow patent. It should be noted that the "bagasse" Chow refers to is sugarcane bagasse. Additionally, applicants' disagree with the suggestion of the Examiner that "the particular source of the plant fiber is not critical to the invention of Chow." In producing the boards of the Chow invention, the thermo-sensitive "adhesive is separately admixed with the exo-s-plant fiber mass, which when compressed and cured in the subsequent pressing operation, will provide the inner core fiber layer of the sandwich board. In cases wherein one or more of the two face layers of the sandwich board is to be produced from in situ bonded discrete s-plant fibers, one or more masses of s-plant fibers similarly are separately admixed thermoplastic or thermosetting adhesive" (col. 3, lines 7-18). Applicants' submit that the particular source of the plant fiber is extremely important as shown in the descriptions of face and core plant residue fiber in the Chow patent. There is no teaching or suggestion that *Parthenium* species lignocellulosic plant material having naturally occurring resin has the properties required to make the particle board panels of the Chow patent.

Chow and the claimed invention further different with regard to the amount of resin used. The amount of thermo-sensitive resin taught by the Chow patent to make the sandwich panels is 2 to about 15% (col. 1, lines 12-15; col. 3, line 35 and claim 9). This amount is in keeping with that taught by references regarding production of wood-based panels. The Examiner is directed to page 10-16 (copy enclosed) of Chapter 10 of the Wood Handbook (USDA Forest Service Agricultural Handbook: Wood-based Composites and Panel Products, Wood Handbook: Wood as an Engineering Material, prepared by the Forest Products Laboratory, Forest Service USDA, General Technical Report FPL-GTR-113, pp. 10-1 to 10-31) (cited on page 30 of applicants' specification), where it states that thermoset or thermoplastic resins arc used <u>at less than 15% resin</u>. Ranges described in the Handbook are 4-10%, 8-15%, 4-8%. Thus, the amount of resin taught by the Chow patent is in keeping with the amount of resin taught by the industry for preparation of wood-based composites and panel products. If one describes the range of 2-15% resin as a ratio range of resin to plant material, it would be 2% resin: 98% plant material to 15% resin to 85% plant material. In contrast to thc teachings of Chow and the Wood Handbook, applicants' claimed invention state that "the ratio of plastic to plant material ranges by weight from 80% plastic:20% plant material to 20% plastic:80% plant material" (claims 1-8, 10-11, 13-16) or "the ratio of plastic

to plant material ranges by weight from 80% plastic to 20% plant material to 30% plastic to 70% plant material" (claims 9 and 12). This is not taught or suggested by Chow, alone or in combination with Schloman.

In addition, the composites of the invention provide termite and fungal resistance and are useful for making insect- and fungal-resistant wood products (see paragraph [0013] and Tables 1-3 of the specification). Such properties are not taught or suggested by Chow, alone or in combination with Schloman.

It is submitted that the critical elements essential for Applicants' invention are not taught or suggested by Schloman or Chow, alone or in combination. In view of the foregoing, it is submitted that claims 1-16 define an invention which is unobvious over the cited art.

There is No Motivation to Combine the References As Suggested by the Examiner

To support a rejection under 35 U.S.C. 103, there must be some teaching in the prior art that suggests the desirability or incentive to make the modification needed to arrive at the claimed invention. In the instant case, the cited art is devoid of such a teaching to combine the references as suggested by the Examiner. There is no basis to combine the Schloman patent which teaches free-flowing particulate compositions useful as fuels or soil amendments with the Chow patent which describes particle board panels, and the cited art is devoid of any teaching to combine the references. Further, it is submitted that the cited art does not teach or suggest the critical elements essential for applicants' invention, and thus the combining of the cited art does not provide applicants' claimed invention.

Summary and Conclusions

The claims, as amended, fully meet the requirements of 35 U.S.C. 112, second paragraph.

None of the cited references taken alone or in combination teach applicants' invention or suggest an expectation of success of applicants' claimed invention; thus, the claims are not anticipated by the art and the claims are unobvious over the cited art.

PATENT

It is believed that the application is in condition for allowance. If the Examiner has any questions, comments or suggestions, the undersigned attorney earnestly requests a telephone conference.

Respectfully submitted,

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Enclosures:
Nakayama et al., *Abstr. Assoc. Advance. Ind. Crops*, page 35 (1996)
Schloman et al., in *Bioresource Technology* 35: 191-196 (1991)
Page 10-16 USDA Forest Service Agricultural Handbook: Wood-based Composites and Panel Products, Wood Handbook: Wood as an Engineering Material, prepared by the Forest Products Laboratory, Forest Service USDA, General Technical Report FPL-GTR-113
Postcard Receipt

1996. Abst. Assoc. Advancement Ind. Crops. San Antonio. p. 35*

Guayule Latex Preparation

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Since the recent discovery that the latex from guayule (*Parthenium argentatum*, Gray) is hypoallergenic, unlike *Hevea* (*Hevea brasiliensis*, Muell-Arg.), a great interest has been generated in its potential application for fabricating medical and other consumer items. The guayule latex resides in individual cells and additional processing is necessary to separate the latex from the plant. Previous guayule rubber extraction processes were directed toward obtaining bulk or solid rubber for making tires and are not applicable for latex production. The primary objective of our study was to develop methods for preparing latex suitable for making medical products. The present extraction work was conducted on a laboratory scale, but with the approach that it could be scaled upward for commercial application.

The method we employed is a water-based extraction process so that the final guayule latex preparation can be used directly in a manner similar to the traditional procedure already developed for *Hevea* latex in making films

and tubings. The shrub is first ground in a solution containing an antioxidant and emulsifier. The resultant raw latex emulsion is further stabilized by adjusting the pH between 10 to 11. The latex is then separated from the bulk solution by either a centrifugation or creaming procedure or a combination of both.

Because the specific gravity of the natural rubber latex is less than water, a centrifuge-separation technique can be used. In our investigations, we used a commercially available dairy cream separator. This equipment can do continuous latex separation from the crude ground plant extract solution, whereas the typical laboratory-type centrifuge can handle only small batches at a time. Alternatively, the latex can be separated from the ground plant-solution mixture with the "creaming" technique by adding a density-viscosity modifier, ammonium alginate, to the solution. Creaming depends upon gravity separation and is slower than the centrifuge-separator method, but it does not require any elaborate equipment. Details of the extraction procedures and the composition of the processed latex will be discussed.

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The plant material left after latex extraction is what we call Guayule bagasse.

Normally this bagasse would be discarded as plant waste.